AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listing, of claims in the application:

Listing of Claims

1. (Currently Amended) An atomic layer deposition process for using a reaction sequence to ~~deposit layers on~~ produce a high temperature superconductor substrate, the process comprising:

a) placing the substrate in a chamber;

~~a)~~ b) maintaining an uninterrupted inert fluid stream through the chamber;

~~b)~~ c) heating the chamber;

~~c)~~ d) forming a first self limiting layer of a first gaseous precursor moiety molecule[[s]] upon the substrate by inserting the first gaseous precursor moiety into the fluid stream;

d) without interruption, exposing the ~~substrate and~~ first layer to gaseous molecules of a second moiety by inserting the second moiety into the fluid stream at a concentration and for a time sufficient for the molecules of the second moiety to be absorbed to the first layer;

e) allowing the first moiety to react with the second moiety in a self limiting reaction so as to form a monolayer of product moiety molecules wherein the inert gas flows through the chamber for the duration of the complete deposition.

2. (Original) The process as recited in claim 1 wherein the process occurs at temperatures ranging from about 200°C to 400°C.

3. (Currently Amended) The process as recited in claim 1 ~~wherein steps c through e are repeated~~ further comprising

f) without interruption, exposing the monolayer of product moiety molecules to gaseous molecules of a third moiety at a concentration and for a time sufficient for the

molecules of the third moiety to be absorbed to the monolayer of product moiety molecules; and

g) allowing the monolayer of product moiety molecules to react with the third moiety in a self limiting reaction so as to form a second monolayer of product moiety molecules.

4. (Currently Amended) The process as recited in claim 1 wherein ~~steps c, d, and e are self-limiting~~ three layers are deposited on the substrate without removing the substrate from the chamber.

5. (Currently Amended) The process as recited in claim 1 wherein the process is performed at a continuous pressure of ~ 1 Torr.

6. (Currently Amended) The process as recited in claim [[1]] 3 wherein the steps f and g are repeated so that more than three precursor moieties can be applied to the substrate's surface.

7. (Currently Amended) The process as recited in claim 1 wherein the inert fluid stream comprises a carrier gas is selected from the group consisting of nitrogen, argon, and helium.

8. (Original) The process as recited in claim 1 wherein layers of product moiety are deposited as a film.

9. (Original) The process as recited in claim 8 wherein the film growth rate is up to about one micron (μ) per hour.

10. (Currently Amended) The process as recited in claim [[1]] 3 wherein ~~layers required for HTS superconductor materials~~ a buffer layer, a high-temperature superconductor layer, and a capping layer, are ~~can be~~ deposited without removing the substrate from the process chamber.

11. (Original) The process as recited in claim 1 wherein inert carrier gas facilitates transport of the gaseous moieties into and out of the chamber.

12. (Original) The process as recited in claim 10 wherein layers of mixed yttrium oxides, barium oxides, copper oxides and calcium oxides are deposited onto the substrate to fabricate HTS superconductors.

13. (Original) The process as recited in claim 1 wherein each of the moieties are supplied to the chamber as a pulse of pure gas.

14. (Currently Amended) The process as recited in claim 13 wherein the pulse has a duration of between one tenth of a second and ~~one~~ ten seconds.

15. (Currently Amended) The process as recited in claim 13 wherein the uninterrupted inert fluid stream ~~a pulse of inert gas is provided~~ is maintained during and between each pulse of pure gas.

16. (Withdrawn) A device to facilitate conformal deposition of atomic layers upon substrates, the device comprising:

a) a reaction chamber;

b) a means for injecting fluid into the reaction chamber at pulsed intervals;

c) a means for removing the pulsed fluid from the reaction chamber; and

d) a means for regulating the atmosphere and temperature of the chamber.

17. (Withdrawn) The device as recited in claim 13 wherein the injecting means comprise valves for regulating the release of different precursor reactant moieties and inert carrier gas.

18. (Withdrawn) The device as recited in claim 13 wherein the atmosphere regulating means comprise vacuums to create negative pressure and effect gas flow through the device.

19. (Withdrawn) The device as recited in claim 13 wherein the atmosphere regulating means is capable of maintaining precursor reactant moieties in the vapor state.

20. (Withdrawn) The device as recited in claim 13 wherein the computerized gas pulse switch comprises a programmed computer and a pneumatic valve.

21. (New) The process as recited in claim 1 wherein YBCO doped with calcium is deposited with the resulting layer subjected to annealing to facilitate Ca diffusion along YBCO grain boundaries.

22. (New) The process as recited in claim 1 wherein the substrate surface is initially covered with hydroxyl moieties, prior to forming the first layer.

23. (New) The process as recited in claim 22 wherein the hydroxyl moieties react with trimethyl aluminum as the first gaseous precursor to form the first layer comprising alumina.

24. (New) The process as recited in claim 23 further comprising displacing methyl termini on the alumina first layer with additional hydroxyl moieties.

25. (New) The process as recited in claim 24 wherein the additional hydroxyl moieties react with trimethylaluminium as the second moiety to produce another layer of alumina.

26. (New) The process as recited in claim 1 wherein the substrate has a width to loop-separation-distance ratio of 10,000 and the substrate is coated on all sides all at once.